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ABSTRACT

This study examines how a group of Japanese teachers cooperatively designed lessons using a television program and other materials for social and environmental studies. Teachers started the design by identifying their aims of instruction through examining the contents of an educational television program. This program described how a group of volunteers dug a well using traditional machinery of bamboo trees and seeks to apply this method in other countries where people need water and where modern technology is not appropriate to use. The cooperative design proceeded through several decision points of teacher domain and media domain. Based on this work, three different instructional sessions were conducted in which the television materials were used in order to accomplish the teachers' aims which differed from one another. This work showed that teachers can attain individual aims from the common materials and also presented a model for cooperative design of classroom instruction. (Contains 6 references.) (Author/TMK)

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Teachers' Cooperative Design of Instruction with Media for Social and Environmental Studies

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Abstract:

This study examined how a group of teachers cooperatively designed lessons using a TV programme and other materials for social and environmental studies. Teachers started the design by identifying their aims of instruction through examining the contents of an educational TV programme. This programme described how a Japanese group of volunteers digs a well using a traditional machinery of bamboo trees, and seeks to apply this method in other countries where people need water and where modern technology is not appropriate to use. The cooperative design proceeded through several decision points of teacher's domain and media domain. Based on this work, three different instructional sessions were conducted in which the TV programme was used in common as the main material, but also other different materials were used in order to accomplish the teachers' aims which differed one from another. This work showed that teachers can attain individual aims from the common material and also presented a model for a cooperative design of classroom instruction.

Introduction

The purpose of this study is to examine how a Japanese group of elementary school teachers can cooperate in designing classroom utilization of an educational television programme. The group to be reported on is "Kanazawa Association of Elementary School Teachers for Educational Media". The teachers as a group cooperatively started to design their classroom instruction by iteratively identifying their aims of instruction and analyzing the content of a television programme. It was followed by three different classroom instructional sessions using the same television programme as the main material, as well as various supplementary materials which were selected according to each of the three teachers' instructional aims. Their aims differed from one another within the scope of social studies emphasizing environmental issues.

The whole process of the design and instruction was observed by a group of researchers, and the major parts, including the three classroom sessions, were video-recorded for the later use of the video as teacher training material. This work was based on the research project of "media mix study" which was sponsored by and organized at the National Institute of Multimedia Education, Japan. Some background

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ideas within this project are presented before the design and instructional activities of the teachers are described.

Background concepts and the project outline

How we characterize "media mix"?

"Media mix" is a concept which has been advocated since the late 1980's in a Japanese context of the use of educational broadcasting (Mizukoshi, 1986; Yoshida, 1987; Saga, et als., 1988). A societal background for this movement is a rapid development and diffusion of newer electronic media which has changed the surrounding conditions of the use of educational television in schools. Educational television, which was started in 1953 by NHK (Japan Broadcasting Corporation), is no longer new, and so its original motivational power for students and teachers has been lost partly. In addition, in a rapid societal change characterized mainly by the development of new communication technology, it has been recognized that we need to reconsider our notion of learning. We see, for example, that our educational emphases may change from memorizing facts to thinking and creating, from establishing manners of behavior to developing the skill for survival. Other emphases may include learning skills, critical thinking, a sense of collaboration, multiple perspectives, cultural tolerance and empathy for those who are different. The idea of "media mix" was presented in such a context.

"Media mix", while functioning to a certain degree as a slogan to activate the use of educational television, aims as an instructional strategy at deepening and widening the cognitive and affective processes of children by adding and concurrently using different media materials in instructional situations along with certain television programmes. By doing so, it is also expected to allow children to experience various media as their learning tools and to cultivate in them a sense of critically appreciating different points of view. What is crucial here, however, is the messages or contents of media materials rather than the media themselves as technology. For example, the message from the main medium, say a television programme, is supplemented with or strengthened by a different message from another medium. The same message may also be compared to or even negated by another message which could come from a video, book, film, computer, field trip, person, or whatever else that might be relevant to the learning situation. By facing a contradiction in such a situation, for example, students are expected to deepen their thinking and to be motivated for solving the problem. Some typical models of "media mix" planning are illustrated in Figure 1. The concept of "media mix" reflects a reconsideration of the use of educational broadcasting in Japanese schools, which, historically, has been rather more static, as an educational movement, than flexible. It is also a suggestion for the planning and recreating of educational broadcasting as its status among other newer media changes.

[Put Figure 1 about here.]

The project of "media mix" study

This project started in 1988 at the National Institute of Multimedia Education. Its aim was to plan, carry out, and evaluate a series of classroom instructional sessions in which different media and materials were used in certain combined ways in order to realize more meaningful and evocative teaching with regard to learning objectives, contents, and learners' mental activities. We called such an instructional strategy "media mix" and a television programme was generally assumed to be the main medium. We planned to start this series of work at the elementary school level, and then move to the secondary school level, through which we also hoped to obtain helpful suggestions to improve instructional practices in higher education, an area that was more directly connected to our institutional purposes at the Institute. In addition, the intention was also to produce documentary video materials which could be used for pre- and in-service teacher training courses, since this project was set up within the Institute's programme for the development and evaluation of teacher training materials.

A team of educational researchers was organized to conduct the project, including those from Osaka University and Kanazawa University and teachers from Kyoto, Kanazawa, and Otsu. The team selected the following two places for the first-year activity and another place for the second-year activity.

a) Kyoto Municipal Seisho Elementary School

We planned classroom instruction for a sixth grade class in the history area of social studies. The teacher used a television programme selected from the "History of People's Life" series as a main medium. After watching the programme, children were divided into five small groups according to the themes the programme presented and that they became interested in. Those groups then pursued their own inquiry with different media materials and activities.

b) A Group of Kanazawa Municipal Elementary Schools

Based on the cooperative instructional design by a group of elementary school teachers in Kanazawa, we planned three classroom sessions for fifth graders in which a television programme from the series of "We Are All People on the Earth" was used as the main medium for social and environmental studies. Since the three teachers had their own differing instructional aims, they used different set of sub-materials to attain their aims.

c) Shiga University's Junior High School

This school in Otsu has introduced a comprehensive curriculum in which students formed small groups to conduct research projects on Lake Biwa, the largest lake in Japan, near which the school is located. Their research covered a wide range of topics such as history, art, industry, water, biology, geology, and ecology. We followed students' activities from their start in May to the school's Lake Conference in October, during which various media were used to facilitate learning.

These cases were all observed by the project team and evaluated in the context of their own significant characteristics. The project team, supported by a professional

video crew, also recorded these instructional activities with video which was then edited for use as teacher training material. Although each case is uniquely interesting, what follows is about the second case, since the idea and process of teachers cooperating in the design of instruction is worth being applied widely to other situations.

Kanazawa teachers' cooperative design of instruction

The group of teachers

In Kanazawa, one of the most historic cities in Japan, the "Kanazawa Association of Elementary School Teachers for Educational Media" was organized more than twenty years ago. This group, supervised by Prof. Sadasuke Yoshida of Kanazawa University, has conducted research on the use of media, especially television, based on their natural classroom settings (Munesue, 1989). The teachers of the group have been also supported by the Prefectural Education Centre in using its facilities and resources. The quality of their cooperative work has been clearly beyond the standard of Japanese teachers, and their outstanding work includes a study of the use of television for environmental studies, a research project on children's viewing skills of educational television programmes, and the development of a visual literacy curriculum for elementary schools. As for the present project of "media mix", about ten member teachers have participated in the team work regularly since its start.

The television programme as related to the teachers' wishes

Every teacher in the group is an active user of educational television. As a group, they first decided to use a program from a new NHK television series for elementary school interdisciplinary study, "We are All People on the Earth." The general aim of this series for the upper graders of elementary school is to enrich and widen children's ways of looking at other people who live in different places of the world and in various fields of society. By using documentary formats, twenty 15 minute programmes of this series try to combine, through particular events and people's activities, various aspects of human life such as natural environment, local community, and international relations. The series does not depend on a single subject matter, but rather expects teachers to use it in flexible and comprehensive ways.

Based on the preview and discussion, the teachers selected from the series a particular programme, "Digging a Well in the Desert by Bamboo," for their classroom instruction. This programme describes a group of Japanese volunteers who use a traditional tool made of bamboo trees to dig a well without the help of electricity, gasoline and modern machinery. They are applying this traditional technology to help people in other nations where water is scarce and it is not appropriate to use modern machines. The programme tells about the structure and function of this traditional technology, the group's activity in the Philippines, and their hope to introduce it into other countries in Asia and Africa.

Through examining this programme, the teachers of Kanazawa had different aims or wishes for pupils in their own classes. One teacher emphasized the importance of traditional technology compared to modern ones in so far as they relate to the environment; another teacher thought that people's international cooperation in terms of the need for water was more significant; the third teacher wished to show his pupils that some people gladly go abroad to help others. Consequently, the teachers started to plan three different lessons using the same television programme and other different media and messages which were selected to support the varied wishes of each of the three teachers.

The process of the cooperative instructional design

The group of teachers has, through team work in planning and implementing the use of various educational television programmes, gradually developed their own procedures for designing classroom instruction, and elaborated it towards the framework of the so-called "media mix" settings. The design model thus developed by the teachers is a kind of reciprocal process in which the teacher's instructional decisions proceed in a zigzag manner between the points in the teacher's domain and those in the media domain. This model is illustrated in Figure 2, and, as it shows, the teacher's decision proceeds also in a spiral manner, going back frequently to the preceding steps for further elaborations. The steps in the model are briefly explained below.

[Put Figure 2 about here.]

a) to confirm the teacher's wishes (teacher's domain)

What are the wishes the teacher wants to share with children? The teacher also considers the relationship between the general educational objectives of the school and the specific aim he or she wishes to attain.

b) to recognize the intents of the material (media domain)

What does the programme intend to tell the viewers? Where is the central part of the programme embedded in?

c) to clarify the teacher's instructional standpoint (teacher's domain)

Have a clear idea of the theme of the lesson. For example, how would the teacher view human nature and environmental problems? Elaborate the teacher's wishes.

d) to analyze the messages for children's learning (media domain)

Examine whether the materials to be used contain the messages that the teacher wishes to give the children, and have a clear position, positive or negative, about those messages.

e) to clarify the aims of the lesson (teacher's domain)

What does the teacher want to teach? What kind of ability or skills does the teacher wish the children to acquire? Describe the aims clearly in terms of content and ability.

f) to put the main programme into proper place (media domain)

Draw out major tasks and critical points from the main programme, and specify the children's skills necessary to deal with them.

g) to predict the flow of children's thinking (teacher's domain)

Outline the lesson process in terms of the possible flow of children's thinking to be evoked by the series of messages.

h) to examine children's preconditions for viewing (media domain)

Examine if the messages to be given are appropriate for children given their interests and ability.

i) to decide on the type of instruction (teacher's domain)

Have a clear plan on what type of lesson should be adopted (e.g., inquiry, reception, discussion, etc.), and on what type of mental process in children should be expected to be evoked by the series of combined messages (e.g., supportive, contradictory, giving a different viewpoint, or developing a part of the message).

j) to arrange supplementary materials (media domain)

Select a set of supplementary materials (sub-media) and put them into appropriate places within the instructional process.

k) to decide on the process of the lesson (teacher's domain)

Create the final plan of the instructional process considering the predicted flow of the children's thinking and activities with corresponding interventions by the teacher.

l) to design the viewing-card for children (media domain)

Design the viewing card to be used by children during the lesson. This card is also used for evaluating the lesson in terms of children's attainment of the instructional aim and the teacher's wishes.

Method of analyzing the programme messages

The contents or messages of the programmes to be used in the lesson is always an important factor in designing instruction using any media materials. The group of Kanazawa teachers has developed the following process for analyzing the messages of an educational television programme. This is basically a group-method which has grown out of the teachers' cooperative work and long-term practical experiences. In relation to their design model, this process corresponds to steps b, d, and f in the media domain of Figure 2.

- a) Teachers in the group watch the programme and, while watching, take notes of what they consider to be the key scenes and impressive parts of the programme.
- b) Each teacher writes down the key scenes on note cards, one scene on one card, and puts them on the table.
- c) Teachers in the group put the similar cards together, and arrange these stacks in the sequence of the programme.
- d) Teachers discuss and select ten to fifteen key scenes which are more important than others, and give names to these scenes.

- e) Each teacher thinks about the relationships between these key scenes, and creates pairs of these scenes according to how he or she thinks each of them relates to the other.
- f) Create a matrix table of the pairs of the key scenes and calculate how frequently each pair is presented by the teachers.
- g) Based on this matrix, teachers discuss and draw a diagram of the major relationships between the key scenes, and also a diagram of the content structure of the programme.

Through this process, teachers develop a deeper understanding of the programme messages and structure and clearer ideas of what they wish to share with the children. The Kanazawa teachers have drawn from the analysis of "Digging a Well in the Desert with Bamboo" two types of major relationships of the key scenes. As shown in Figure 3, type A emphasizes the meaning of traditional technology while type B emphasizes people's international cooperation. Both types are related to environmental issues of water and the means to obtaining water.

[Put Figure 3 about here.]

The teachers then collected supplementary materials to be "mixed" with the main programme from the standpoint of their wishes and the message characteristics that they want to emphasize. In such a "media mix" context, writing a lesson plan contains additional factors which are not apparent in a single medium situation. Teachers should have a sure reason for using different materials together, and should improve descriptions of the plan in terms of the expected thinking processes of the children. They should also carefully describe the characteristics of the messages of the materials in relation to the children's expected thinking processes.

Three different instructional sessions by Kanazawa teachers

Based on the cooperative work reported above, three different sets of classroom instruction were planned and conducted. The three teachers used the same programme, "Digging a Well in the Desert with Bamboo", as the main medium in combination with different supplementary materials selected according to their different instructional aims. In order to examine the appropriateness of the materials, the teachers of Kanazawa had a small group of children from another school watch the materials before the actual lessons, and used those children's responses to revise their lesson plans. The three classroom instructions are summarized as follows. The first lesson corresponds to type A in Figure 3 and the other two lessons to type B.

a) Ms. Mieko Matsuda's class

The aim of Ms. Matsuda's lesson is that children know about the roles of high technology within Japan's interrelationship with other countries and also, in contrast, about the significant value of traditional technology such as "digging a well with

bamboo" in terms of people's needs and its energy-free nature.

The teacher first showed "Car Export", an NHK's educational TV programme, as a sub-medium and tried to make children think about Japan's high technology and the need for it. However, she also emphasized by reading a newspaper article that some social conflicts were caused by exporting high-tech products. The class went further to examine another aspect of technology by watching "Digging a Well in the Desert with Bamboo". Children then knew that in some places such traditional technology was more suitable and that technology could be more natural to people and to the earth. The crucial point in this lesson was, to demonstrate, by presenting two conflicting messages, how children could get higher-order thinking about the use and nature of technology.

b) Mr. Hideaki Mitamura's class

In this class, it was intended that children appreciate the pleasure that Japanese engineers and the people in a village of Mali showed by digging a well cooperatively in a place that lacked water. It was expected that this appreciation would come from what the children would know about the activity of a Japanese group learning to dig a well and also about the life of people in a country where water is scarce.

Mr. Mitamura first used "Desert, Water and Life", a video made by Japan International Cooperation Agency, as a sub-medium, because he thought that the actuality of lacking water was not fully described in the main medium, "Digging a Well in the Desert with Bamboo". After watching the main medium, children viewed part of the first video again. By adding another deeper description about life where there is a water shortage, children were expected to have stronger perceptions about the pleasure of people when they succeeded in getting water. Here, the crucial point was whether the children could grasp the emotion of the people more deeply by receiving two mutually-related messages one after another.

c) Mr. Masaki Okabe's class

Mr. Okabe's aim was that children understand, through focusing on the thought and behavior of a young man depicted in the main programme, hopes and emotions of people who gladly go abroad to help other people get water.

To attain this aim, he planned to give children continuous impacts on their thinking by presenting a series of different messages. He first introduced a map of Africa with an overhead projector and showed part of the video, "Desert, Water and Life", without sound. Before watching the main programme, "Digging a Well in the Desert with Bamboo", he used a computer to present on-line newspaper articles on Japan's international cooperation. He also distributed to the class, after watching the main programme and discussing it, copies of a newsletter article written by a young Japanese about his experience in Nepal as an engineer of sewerage facilities. All material was intended to deepen children's understanding of hopes and emotions of people who go abroad to help other people get water. The crucial point here was to follow how children's recognitions were changed according to the reception of successively presented messages.

Discussion

The three lessons were thus conducted and recorded with video for use as teacher training material. The video is now widely used at departments of education in many universities and at in-service teacher training institutes. It was later converted into a videodisc to be developed as an interactive multimedia package. In my own use of this video at pre- and in-service training occasions, students' reactions to it were generally very positive especially for viewing the teachers' team work in designing their instruction and the three teachers' uniquely constructed lessons. This video was also used as material to examine college students' mental effort in watching videos and its effect on learning (Saga, 1993).

Returning to the three particular lessons, the teachers had their own differing wishes for the children. The first teacher wished her class to understand the value of traditional technology; the second teacher aimed at showing people's pleasure when they got water; and the third teacher focused on the desire of a Japanese man for international cooperation. We obtained, on the next day of the lessons, children's free answers on what they had learned from the lessons and their recall of some factual information in the main programme. Analyzing the free answers revealed that there were not as many children as expected who had attained fully the quality of conception which the teachers had wished as their instructional aims. However, by examining some sample viewing cards which children drew during the lessons, we could see that in the process of lessons they significantly changed and deepened their thoughts towards the teachers' expected directions. As for the recognition of factual information, most children showed satisfactory results although some question items were too easy to distinguish their achievement. Saga (in press) obtained additional data on children's preconceptions of different media and found that such preconceptions were related to the teachers' teaching styles and possibly affected children's learning from the lessons.

To note here my own reflection on the aims of these instructions, the teachers were not completely free from stereotyped views held by many Japanese about foreign countries as well as about their own country. It also seems that there was an easy dichotomy between old and new technologies, somewhat shallow treatments of the issues of water and environment, and a lack of viewpoints from outside to Japan and the Japanese. Another reflection which was shared by all the members of the project team was that in these three cases the teachers' leading role was so strong that we should plan another prototype development in which children would take more initiatives to explore their learning tasks and to use media as their own tools. However, this does not devalue the present activity, because through this rather ambitious attempt for cooperative design of instruction, the following positive outcomes were obtained.

- It showed that teachers can cooperate to design their lessons in such a way that they can recognize significant aspects of the materials better and appreciate different points of view from other teachers.

- It presented a prototypic strategy to analyze the contents of media materials and to plan the lessons in multimedia situations.
- It showed that teachers can have their own unique aims and flexible plans of instruction even when they share common teaching materials, which seems especially important in the Japanese context where the use of educational television has been more formal than pliable.
- The design strategy presented here can be developed to be used in other instructional situations where teachers do not use media, because it focuses on messages rather than media themselves.

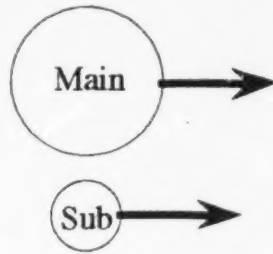
Acknowledgements

I would like to thank all the members of the "media mix" project team as well as the teachers of Kanazawa. Figure 1 was adapted from Mizukoshi (1986), and Figures 2 and 3 from Munesue (1989).

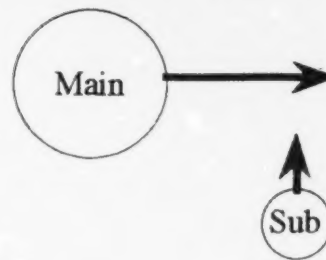
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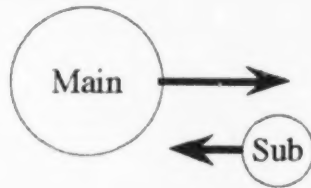
1. Supportive



2. Changing viewpoint



3. Contradictory



4. Partial development

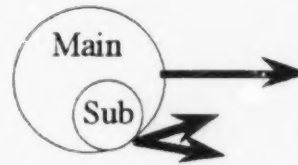


Figure 1. Models of "media mix" relationship

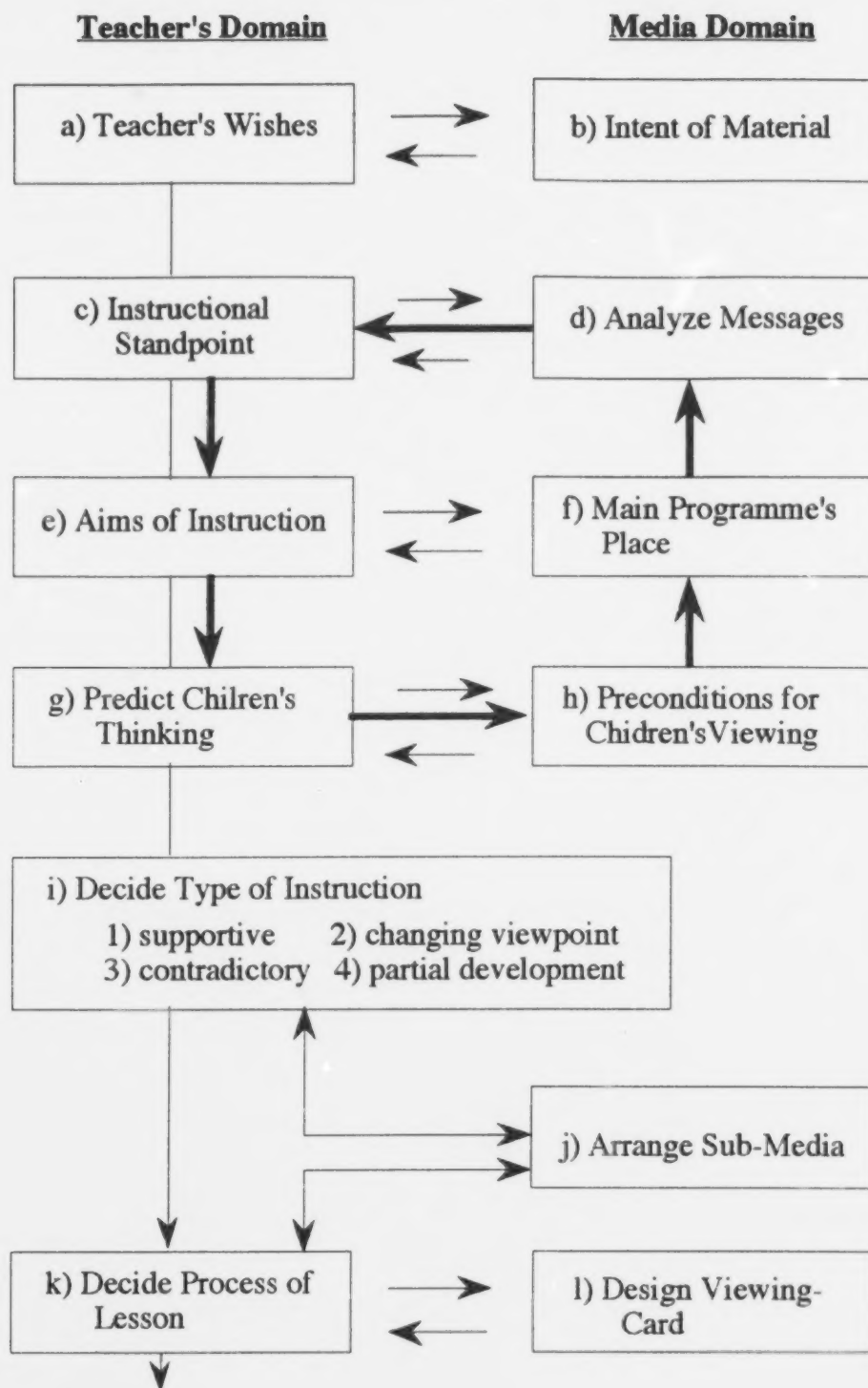
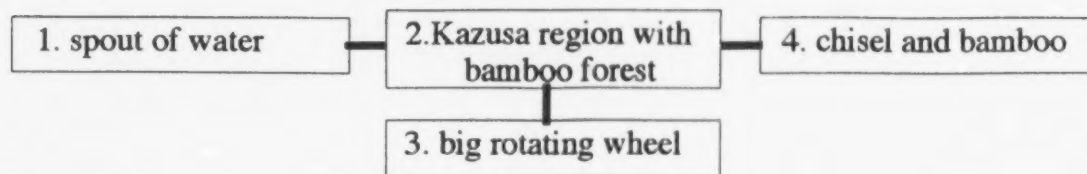


Figure 2. Process of instructional design

Type A: Traditional technology in Japan



Type B: International cooperation

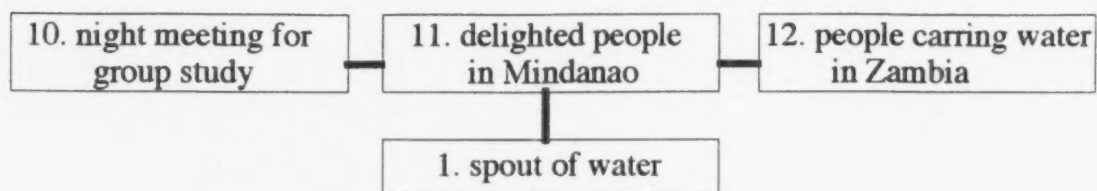


Figure 3. Two types of key scene relationships